PEKIN GEOLOGICAL SCIENCE FIELD TRIP

David L. Reinertsen Robert S. Nelson Myrna M. Killey

Field Trip 1985C
October 12, 1985

Department of Energy and Natural Resources
STATE GEOLOGICAL SURVEY DIVISION
Champaign, Illinois 61820

Assemble at the Royal Avenue Pavilion, Mineral Springs Park, Pekin Park District. To get to the assembly point, proceed on Court Street (Illinois Route 9, SR-9) to the 14th Street stoplight. TURN NORTH and go slightly less than 0.2 of a mile and TURN RIGHT (east) at the opportunity on to Royal Avenue. Houses are only along the north side of Royal Avenue. The pavilion is about 0.2 of a mile to the east.

Miles to next point	Miles from starting point	
0.0	0.0	Mileage figures start at the intersection of Royal Avenue and Woodland Street: a 2-way stop. Head west on Royal Avenue.
0.1+	0.1+	Crossroad, TURN RIGHT (north) on Sycamore.
0.15-	0.25	STOP: (1-way). TURN RIGHT (east) on Broadway Street and immediately cross railroad tracks; abandoned Atchison, Topeka and Sante Fe (AT&SF) and Conrail.
0.6+	0.85+	CAUTION: Stoplight. CONTINUE AHEAD (east) on Broadway. To the right beyond Parkway Drive is the Parkview Gold Course.
0.85-	1.7	Regal Coal Company, abandoned shaft located 360 feet to the south. Springfield (No. 5) Coal was 56 inches thick at a depth of 205 feet. Total production of coal from 1906 to 1925 was more than 237,000 tons.
0.5	2.2	Prepare to turn left.
0.1	2.3	TURN LEFT (north) at the entrance to the Pekin Country Club. Continue through Country Club Estates on Country Club Drive.
0.2+	2.5+	CAUTION: Road very crooked. Cross "South Fork" Lick Creek.
0.2-	2.7	Club house entrance to the right. CONTINUE AHEAD (northerly).
0.6-	3.3-	STOP: (1-way): T-road intersection. TURN LEFT (from 1770 E) onto Sheridan Road (1785 N).
0.3+	3.6	CAUTION: descend the steep valley wall of "South Fork" Lick Creek.
0.4	4.0	Cross bridge over "South Fork" Lick Creek.

Miles to next point	Miles from starting point	
0.1-	4.1-	**STOP 1.** Discussion of Pennsylvanian bedrock exposures along "South Fork" Lick Creek. **NOTE:** Park off the road as far as possible safely. Abundant poison ivy. Creek bottom is a short walk to right (north); then turn left for about 200 feet to the bedrock exposure along the south side of the creek.
0.0	4.1-	Leave STOP 1 and ascend hill.
0.4+	4.5	Immediately to the right is the Lick Creek Golf Course - Pekin Park District. To the right (northwest) in the distance the treeline bluff is on the northwest side of the Illinois River. In this vicinity, the valley is only a mile and a half wide at the most. CONTINUE AHEAD (west) on Sheridan Road.
0.2	4.7	CAUTION: Descend steep hill.
0.15-	4.85-	STOP: (4-way) Parkway Drive. CONTINUE AHEAD (west) on Sheridan Road.
0.35+	5.2	The irregular topography ahead for about one mile resulted from the highest water levels of the Kankakee Torrent nearly 12,500 years ago. Abandoned Illinois Central Gulf (ICG) Railroad grade.
0.8	6.0	CAUTION: 8th Street stoplight. TURN RIGHT (north) on 8th Street (SR 29).
1.0	7.0	Worley Lake to the left beyond the Peoria and Pekin Union Railroad.
0.35	7.35	The lake to the right is at the site of a former sand and gravel pit. Now it has a number of apartments and single family residences around it.
0.2-	7.55-	SR 98 to Morton to right. CONTINUE AHEAD (northeasterly) on SR 29.
0.15	7.7-	On the north side of the Morton Road is another water-filled, abandoned sand and gravel pit that has home sites around it.
0.3+	8.0	Gravel pit to the right has been turned into a swimming area.

Miles to next point	Miles from starting point	
0.2	8.2	Cross Lick Creek. During dry periods there may be no water in this portion.
1.1	9.3	CAUTION: Stoplight. CONTINUE AHEAD.
0.1+	9.4+	CAUTION: Stoplight. Marquette Heights. CONTINUE AHEAD.
0.1	9.5+	CAUTION: Enter Creve Coeur.
0.1	9.6+	CAUTION: Stoplight; access to I-474. CONTINUE AHEAD on SR 29.
0.1+	9.7+	I-474 Overpass. CONTINUE AHEAD.
0.2-	9.9	CAUTION: Stoplight. CONTINUE AHEAD up the hill.
1.05	10.95	CAUTION: Creve Coeur business district. CONTINUE AHEAD.
0.25-	11.2-	CAUTION: Stoplight. CONTINUE AHEAD and descend hill.
0.8+	12.0	The slope mine of the Lake Erie Mining Company was located about 0.2 mile to the left (northeast) near the far side of the P&PU RR yards. Slope southerly about 7° and over 260 feet long. The mine opened in 1900 and operated under several names before it was closed in 1939. Springfield (No. 5) Coal averaged about 48 inches here. Slightly less than 3.4 million tons of coal were produced from this mine.
0.2	12.2	CAUTION: Wesley Road stoplight. Prepare to turn right.
0.05-	12.25-	TURN RIGHT just beyond stoplight into old parking lot.
		STOP 2. Discussion of land surveys and slumping of earth materials.
0.0	12.25-	Leave STOP 2. CAUTION: TURN RIGHT (northeasterly) on entering highway.
0.2	12.45-	Enter East Peoria.
0.2+	12.65	CONTINUE AHEAD (northeasterly) on SR 116. Junction with SRs 8 and 116.

Miles to next point	Miles from starting point	
0.3-	12.95-	CAUTION: Stoplight. CONTINUE AHEAD (northeasterly). Town Centre Shopping Center to the right. The East Peoria Municipal Building is to the left.
0.1	13.05-	CAUTION: Washington Street Stoplight. CONTINUE AHEAD (northeasterly) on North Main Street.
0.15+	13.2	Cross Farm Creek and then 3 railroad tracks (AT&SF and P&PU).
0.05	13.25	CAUTION: Stoplight. Junction with SR 8. CONTINUE AHEAD (northeasterly) on North Main Street (SR 116) and prepare to turn right just beyond the motel.
0.1	13.35	TURN RIGHT (southeasterly) onto Fondulac Drive and ascend steep hill.
0.15+	13.5+	Cross over I-74. Spectacular view to the left and the right.
0.2	13.7+	TURN LEFT (northwest) into Fondulac Park overlook.
		STOP 3. Scenic view and discussion of drainage history of the Illinois River.
0.0	13.7+	Leave STOP 3 and CONTINUE AHEAD (northeasterly) along the bluff.
0.4-	14.1	TURN RIGHT (southeasterly) at Woodrow Drive. CAUTION: descend steep, narrow road with sharp hairpin turns. Becomes Arnold Avenue near the bottom of the hill.
0.4	14.5	STOP (2-way). TURN RIGHT (southwesterly) on Junction Avenue (SR 8).
0.05+	14.55+	CAUTION: Stoplight. CONTINUE AHEAD (southwesterly) and work to the left lane.
0.25-	14.8-	CAUTION: Washington Street Stoplight; T-street intersection. TURN LEFT and cross the AT&SF single tracks; just beyond is the bridge over Farm Creek.
0.1-	14.9-	CAUTION: Stoplight. CONTINUE AHEAD on Washington Street.

Miles to next point	Miles from starting point	
0.05-	14.95-	CAUTION: entering interchange with I-74. CONTINUE AHEAD on Washington Street, and get in left lane.
0.05+	15.0	I-74 overpass.
0.3+	15.3+	CAUTION: Stoplight. CONTINUE AHEAD (westerly).
0.15	15.45+	Cross Coal Creek.
0.05-	15.50	TURN SHARP LEFT (south) immediately beyond the creek onto Cole Street.
0.1-	15.6	STOP: (3-way) Johnson Street. CONTINUE AHEAD (south). Jay Cee Park to the left.
0.35+	15.95	Peoria Brick and Tile Company to the left. CONTINUE AHEAD. CAUTION: very crooked road.
0.2	16.15	Cross Coal Creek.
0.05-	16.2-	The pit to the left shows a section of Pleistocene materials above with silty zones scattered throughout and some cemented gravels. Some iron fret work in the Pennsylvanian shale at the bottom. There are pieces of coal around, so coal has probably been taken out here close to the creek bottom. Several abandoned coal mines were located along the creek: The Giebelhausen Mine, the Manhattan Fuel Company, and the Doering Coal Mine. They were all shaft mines.
0.1+	16.3	To the left in the ditch and also to the right in various places are mounds of coal refuse.
0.15	16.45	To the left is a sandstone outcrop in the roadcut.
0.15	16.6	To the right is an exposure of clay and shale high in the bank.
0.1+	16.7+	Cross Creek and ascend hill.
0.1	16.8+	Glacial till exposure in roadcut. Along the ditch where there is adequate moisture are patches of <u>Equisetum</u>, a modern form of simple plants related to Pennsylvanian age plants.
0.4-	17.2	The road bears to the right and straightens as it heads due south across the Wisconsinan Le Roy Moraine.

Miles to next point	Miles from starting point	
0.8-	18.0-	Cross I-474 overpass.
0.3+	18.3	To the right are glacial till exposures along the creek.
0.85+	19.15+	**STOP 4.** Discussion of topography in this vicinity. The crest of the small knoll in the field to the right affords a very good view of the surrounding area from the front of the Le Roy Moraine.
0.0	19.15+	Leave STOP 4. CONTINUE AHEAD (south) down the hill onto the earliest known Wisconsinan moraine, the Shelbyville.
0.35-	19.5	TURN LEFT (south).
0.5	20.0	STOP: (1-way) T-road intersection (1950 N, 1875 E). TURN RIGHT (west) and ascend hill on SR 98.
0.45	20.45	Descend hill to the west coming off the Shelbyville Moraine.
1.35	21.8	**NOTE:** Slump along the right side of the road. CONTINUE AHEAD.
0.1	21.9	To the left in the brush are some concrete footings from the abandoned Lakeside, which operated from 1933 until 1955. The Coal Company shaft was 75 feet deep to 56 inches of Springfield (No. 5) Coal. Total production amounted to more than 478,000 tons.
0.2+	22.1+	TURN LEFT (south) on Parkway Drive.
0.5-	22.6	Cross Lick Creek and enter the Pekin City Limits.
1.1	23.7	STOP: (4-way) Sheridan Road. CONTINUE AHEAD (south) on Parkway Drive.
0.5+	24.2+	STOP: (4-way) Willow Street. CONTINUE AHEAD (south) on Parkway Drive.
0.5	24.7+	CAUTION: (Stoplight): Broadway. CONTINUE AHEAD (south).

Miles to next point	Miles from starting point	
0.15	24.85	To the left as you cross the old railroad tracks is a mound which is the old Hope and Alexander Shaft Mine sites from the 1860s. You can see the gob pile and the railroad cut on the AT&SF.
0.15+	25.0+	TURN RIGHT (westerly) on Stadium Drive.
0.35	25.35	TURN RIGHT. Enter parking lot of the Memorial Arena, the recreation department offices of the Pekin Park District.
0.1+	25.45+	STOP. TURN LEFT (south).
0.05	25.5+	Y-intersection. BEAR RIGHT (westerly).
0.1-	25.6	TURN RIGHT into the parking lot on the east edge of the swimming pool and CONTINUE AHEAD (north).
0.15	25.75	**STOP 5.** Lunch at the Royal Avenue Pavilion.
		Leave STOP 5. Retrace route south along east side of swimming pool.
0.15	25.9	T-intersection. TURN LEFT (northerly) at yield sign.
0.05+	25.95+	Y-intersection at yield sign. BEAR LEFT.
0.05	26.0	Turn right at entrance to parking lot on north side of the tennis courts and the football stadium. Proceed east.
0.1	26.1	STOP: (4-way). Crossroad. TURN LEFT (north) on Stadium Drive. Retrace itinerary to Parkway Drive.
0.4	26.5	STOP: (1-way). T-intersection. TURN RIGHT (south) on Parkway Drive and get in the left lane as soon as possible.
0.35	26.85	CAUTION (Stoplight): Court Street. TURN LEFT on Court Street (SR 9).
0.7+	27.55+	CAUTION (Stoplight): Valle Vista Drive. CONTINUE AHEAD (southeasterly) on SR 9.
0.8	28.35+	CAUTION (Stoplight): Pekin Mall. CONTINUE AHEAD (southeasterly).
0.3-	28.65	To the left and ahead of the rise is the Shelbyville Moraine.

Miles to next point	Miles from starting point	
0.2	28.85	The road narrows from 4-lane to 2-lane.
0.25+	29.1+	Glendale Memorial Gardens on the right. Ascend the Shelbyville Moraine.
1.8-	30.9	Ascend the Le Roy Moraine.
0.5	31.4	Prepare to turn right.
0.05+	31.45+	TURN RIGHT (south) on 2050 E from 1490 N. A farm implement dealership is on the left just after the turn. The road to the south is just to the west of the crest of the Le Roy Moraine.
1.5-	32.95	We've crossed diagonally over the crest of the Le Roy Moraine and are now travelling across the back slope of the moraine.
1.35+	34.3+	Cross tributary to Dillon Creek.
0.1-	34.4+	STOP: (1-way) T-road intersection (1200 N, 2050 E). TURN LEFT (east).
0.15+	34.55+	Cross tributary to Dillon Creek.
0.1+	34.7-	Cross Dillon Creek. Good exposure of till to the right in the cut bank by the barn. CONTINUE AHEAD (east).
0.1+	34.8+	STOP: (2-way) Crossroad. Springfield Road (1200 N and 2090 E). TURN RIGHT (south).
1.15-	35.95	CAUTION: enter Village of Dillon and prepare to turn right.
0.2+	36.15+	TURN RIGHT (west) on 1070 N from Springfield Road.
0.2-	36.35	The view ahead is of the back slope of the Le Roy Moraine.
0.3	36.65	You are starting to ascend the back slope of the Le Roy Moraine and you will be driving across it for the next couple of miles. The road has many sharp turns at 1/4 to 1/2 mile intervals.
1.35	38.00	Notice the very hummocky topography along the moraine surface in this area.
0.7	38.7	We are descending the Le Roy Moraine front.

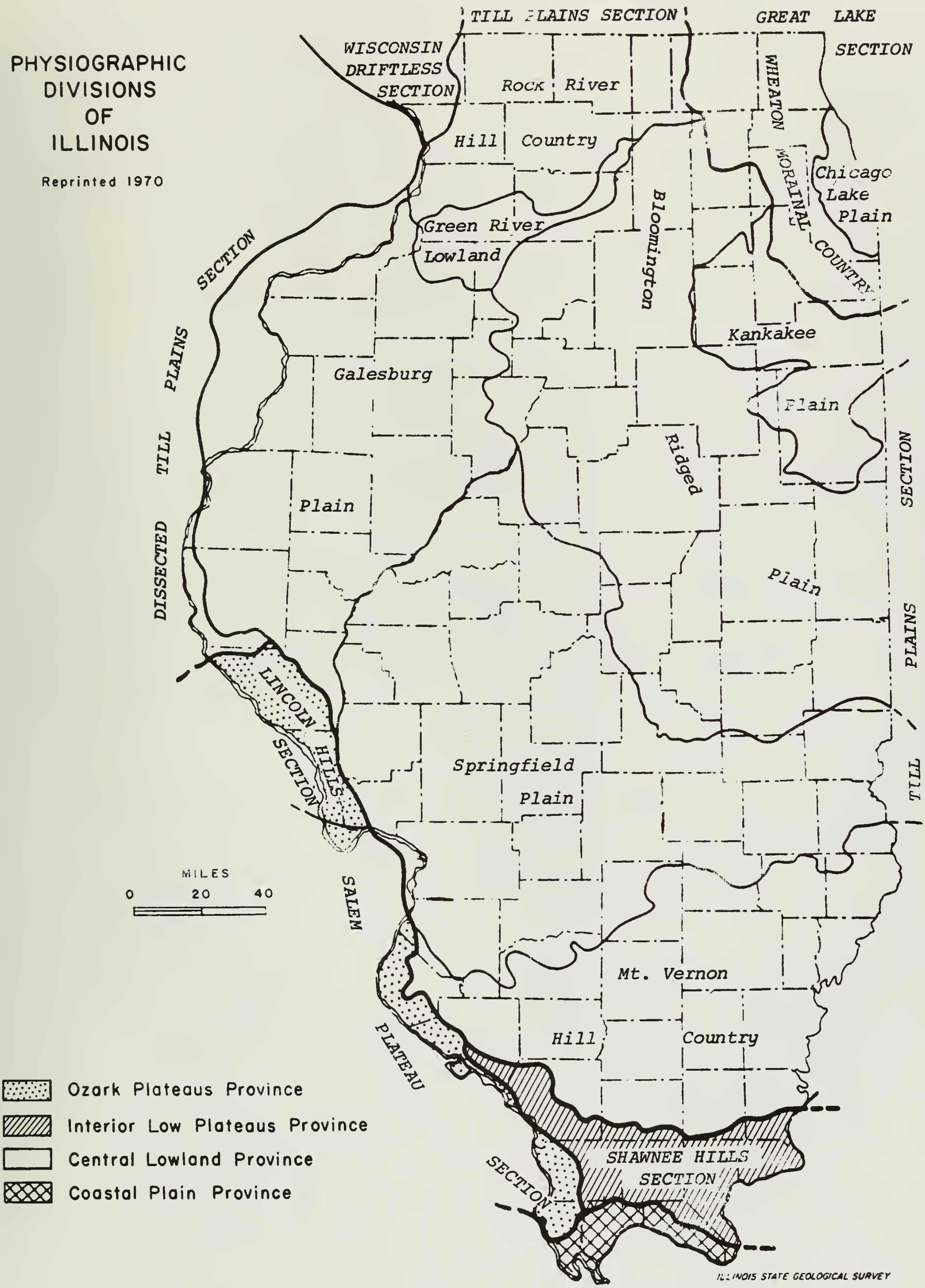
Miles to next point	Miles from starting point	
0.3	39.0	You are heading south again and you are paralleling the moraine front, so ahead you are rising up on the crest of the moraine again.
0.3+	39.3+	**STOP 6.** Scenic view and discussion of landscape adjacent to the Mackinaw River.
0.0	39.3+	Leave STOP 6 and ascend hill.
0.2	39.5+	The road is starting to flatten out and at the 550 foot elevation level, toward the right especially, are remnants of a flat surface that continues on across the road on the left, the Manito Terrace.
0.95	40.45+	CAUTION: 1-lane iron bridge across Mackinaw River.
0.05-	40.5	Ascend hill and make sharp left turn at the top.
0.2+	40.7+	T-road intersection. TURN RIGHT (west).
0.45+	41.15+	Entrance gate to gravel pit. TURN RIGHT (north). **NOTE**: You must have permission to enter this property.
		STOP 7. Discussion of gravel deposit and specimen collecting.
0.0	41.15+	Leave STOP 7. TURN LEFT (east) at entrance gate; resume mileage figures from gate.
0.45+	41.6+	T-road intersection. Turn left (southerly). The Mackinaw River is to the left at the bottom of the bluff.
0.1-	41.7	You are ascending the Shelbyville Moraine front. The road ahead curves around one of the meander loops of the Mackinaw River, but it is hidden by the tree cover.
0.4+	42.1+	T-road intersection from right. TURN RIGHT (south) on the gravel road (1900 E), which is about halfway between the Shelbyville Moraine crest to the left and the toe, downslopes to the right.
0.6	42.7+	The high ground in the distance, to the east southeast, is the Le Roy Moraine.

Miles to next point	Miles from starting point	
1.1-	43.8+	STOP: (1-way) T-road intersection with Toboggan Road (600 N). TURN RIGHT (west).
0.2-	44.0	Start to descend the Shelbyville Moraine front.
0.05+	44.05+	**STOP 8.** Discussion of Pleistocene landforms.
0.0	44.05+	Leave STOP 8. CONTINUE AHEAD (west).
0.75-	44.8	We are down on the Manito Terrace level.
1.05	45.85	In this vicinity the Manito Terrace is a flat surface feature.
1.4+	47.25+	CAUTION: enter the Village of Green Valley.
0.3	47.55+	CAUTION: Illinois Central Gulf (ICG) Railroad Crossing, 2-tracks. CONTINUE AHEAD (west).
0.2+	47.8-	STOP: (2-way) Church Street. CONTINUE AHEAD (west) on Main Street.
0.35	48.15-	STOP: (2-way) SR 29. CONTINUE AHEAD (west).
0.1+	48.25	CAUTION: Chicago Northwestern (CNW), single track crossing. Baraboo Quartzite used for railroad ballast. CONTINUE AHEAD (west).
0.5	48.75	The low knolls and knobs in this area are sand dunes that were deposited across the surface of the Manito Terrace.
0.6	49.35	The road cuts through a notch in one of the larger sand dunes. You can see the sand cropping out in the roadcut.
0.7	50.05	Prepare to turn right just beyond the Bacon Macon Acres.
0.2+	50.25+	TURN RIGHT (north) on Wagon Cellar Road (1250 E) from Toboggan Road.
0.4+	50.7-	Ascend a transverse dune. The farm house to the right, a remodeled school house, sits on top of the dune. CONTINUE AHEAD (north).
0.65+	51.35	Just to the north, beyond the T-road intersection, you are back on the Manito Terrace.

Miles to next point	Miles from starting point	
0.15	51.5	You are descending onto the Havana Terrace. Prepare to turn left just before the farm buildings ahead.
0.3-	51.8-	TURN LEFT (west) at T-road intersection (750 N).
0.75+	52.55	Just beyond the farm house you are descending from the Havana Terrace down to the Bath Terrace.
0.45	53.0	Prepare to turn right just beyond the farm house and the big tree on the right side.
0.15-	53.15-	TURN RIGHT (north) at the crossroad onto the gravel road (1100 E), Tazewell County Line. After turning north, the Breedlove Drainage Ditch is to your left.
0.2+	53.35	The Bath Terrace is the lowest terrace encountered on the field trip.
0.8-	54.15-	CONTINUE AHEAD (north) on the blacktop at the T-road intersection (850 N).
0.5-	54.6+	TURN LEFT (900 N).
0.25-	54.85	The hill ahead is called The Mound and is an erosional remnant of the Manito Terrace.
0.65	55.5	CAUTION: Loose gravel.
0.1-	55.6-	Cross Breadlove Drainage Ditch and ascend The Mound.
0.2+	55.8	Note the relatively flat top of The Mound.
0.1	55.9	Descend the west side of The Mound.
0.1	56.0	To the left, the low mound in the distance is an erosional remnant of the Havana Terrace called Hickory Grove Hill.
0.2	56.2	Cross the Bath Terrace surface.
0.2	56.4	The farm to the right (northwest) is located up on the Havana Terrace.
0.2-	56.6-	CAUTION: Crossroad. Visibility very limited. CONTINUE AHEAD (west) and cross the narrow bridge over Hickory Grove Ditch.

Miles to next point	Miles from starting point	
0.25	56.85-	CAUTION: steep Chicago and Illinois Midland (C&IM) Railroad crossing. Single track, unguarded. CONTINUE AHEAD (west) and ascend onto the Havana Terrace.
0.25+	57.1	Ascend to the Manito Terrace level. Here the Manito Terrace surface again is covered with sand dunes.
0.95+	58.05+	STOP: (2-way) crossroad. TURN RIGHT (north) on Manito Road (750 E). This is a good blacktop and traffic moves fast. Visibility is rather limited to the left; enter highway with caution.
0.1-	58.15	The dunes on the Manito Terrace have a local relief of about 50 feet for the next 2 miles along the Manito Road.
0.9+	59.05+	CAUTION: crossroad. Spring Lake Fish and Wildlife Refuge to the left. CONTINUE AHEAD (north).
0.75	59.8+	At the auto junk yard descend onto the Havana Terrace.
1.2-	61.0	Prepare to turn left.
0.1	61.1	TURN LEFT (west) on 1200 N towards the Springlake Sportsman Club.
0.25	61.35	The low hills crossed here are barchans. These crescent-shaped dunes on the Havana Terrace have a much lower relief--only about 20 feet.
1.1	62.45	Prepare to turn right.
0.15	62.6	TURN RIGHT (north) at T-road intersection (600 E).
0.7+	63.3+	To the left through the trees is the Springlake area.
0.4-	63.7	CAUTION: R-intersection. BEAR RIGHT (east) at the yield sign (1300 N, 620 E) and ascend hill.
0.1	63.8	Park along south side of road. CAUTION: loose sand, don't get stuck!
		STOP 9. Discussion of sand dunes.
0.0	63.8	Leave STOP 9 and CONTINUE AHEAD (east).

Miles to next point	Miles from starting point	
0.2	64.0	The houses and the tree line just ahead are along a longitudinal dune.
0.6	64.6	CAUTION: Village of Talbott.
0.35-	64.95-	STOP: (2-way) crossroad. Manito Road (750 E). TURN LEFT (north) from 1300 N.
0.2+	65.15	We are still on the Havana Terrace.
0.85+	66.0+	To the left is an old meander scar of the Illinois River against the bluff.
1.65-	67.65	Prepare to turn left.
0.15	67.8	TURN LEFT (north) at T-road from left (975 E).
0.05	67.85	TURN LEFT into the entrance gate to the Cullinan Sand and Gravel Pit. You must have permission to enter this quarry.
		STOP 10. Discussion of torrential gravel deposits.
0.0	67.85	Leave STOP 10. Retrace itinerary to the Manito blacktop (1400 N).
		END OF FIELD TRIP.
0.5	67.9	STOP (1-way) T-road intersection (1400 N). TURN RIGHT and head south toward Manito and Havana; or TURN LEFT and go to SR 29 and Pekin.



PHYSIOGRAPHIC DIVISIONS OF ILLINOIS
Reprinted 1970
TILL PLAINS SECTION
GREAT LAKE SECTION
WISCONSIN DRIFTLESS SECTION
Rock River Hill Country
WHEATON MORAINAL COUNTRY
Chicago Lake Plain
Green River Lowland
Bloomington Ridged Plain
Kankakee Plain
Galesburg Plain
DISSECTED TILL PLAINS SECTION
LINCOLN HILLS SECTION
Springfield Plain
TILL PLAINS SECTION
SALEM PLATEAU SECTION
Mt. Vernon Hill Country
SHAWNEE HILLS SECTION
MILES
0 20 40
Ozark Plateaus Province
Interior Low Plateaus Province
Central Lowland Province
Coastal Plain Province
ILLINOIS STATE GEOLOGICAL SURVEY

PLEISTOCENE GLACIATIONS IN ILLINOIS

Origin of the Glaciers

During the past million years or so, the period of time called the Pleistocene Epoch, most of the northern hemisphere above the 50th parallel has been repeatedly covered by glacial ice. Ice sheets formed in sub-arctic regions four different times and spread outward until they covered the northern parts of Europe and North America. In North America the four glaciations, in order of occurrence from the oldest to the youngest, are called the Nebraskan, Kansan, Illinoian, and Wisconsinan Stages of the Pleistocene Epoch. The limits and times of the ice movement in Illinois are illustrated in the following pages by several figures.

The North American ice sheets developed during periods when the mean annual temperature was perhaps 4° to 7° C (7° to 13° F) cooler than it is now and winter snows did not completely melt during the summers. Because the cooler periods lasted tens of thousands of years, thick masses of snow and ice accumulated to form glaciers. As the ice thickened, the great weight of the ice and snow caused them to flow outward at their margins, often for hundreds of miles. As the ice sheets expanded, the areas in which snow accumulated probably also increased in extent.

Tongues of ice, called lobes, flowed southward from the Canadian centers near Hudson Bay and converged in the central lowland between the Appalachian and Rocky Mountains. There the glaciers made their farthest advances to the south. The sketch below shows several centers of flow, the general directions of flow from the centers, and the southern extent of glaciation. Because Illinois lies entirely in the central lowland, it has been invaded by glaciers from every center.

Effects of Glaciation

Pleistocene glaciers and the waters melting from them changed the landscapes they covered. The glaciers scraped and smeared the landforms they overrode, leveling and filling many of the minor valleys and even some of the larger ones. Moving ice carried colossal amounts of rock and earth, for much of what the glaciers wore off the ground was kneaded into the moving ice and carried along, often for hundreds of miles.

The continual floods released by melting ice entrenched new drainageways, deepened old ones, and then partly refilled both with sediments as great quantities of rock and earth were carried beyond the glacier fronts. According to some estimates, the amount of water drawn from the sea and changed into ice during a glaciation was probably enough to lower sea level more than 300 feet below present level. Consequently, the melting of a continental ice sheet provided a tremendous volume of water that eroded and transported sediments.

In most of Illinois, then, glacial and meltwater deposits buried the old rock-ribbed, low, hill-and-valley terrain and created the flatter landforms of our prairies. The mantle of soil material and the deposits of gravel, sand, and clay left by the glaciers over about 90 percent of the state have been of incalculable value to Illinois residents.

Glacial Deposits

The deposits of earth and rock materials moved by a glacier and deposited in the area once covered by the glacier are collectively called drift. Drift that is ice-laid is called till. Water-laid drift is called outwash.

Till is deposited when a glacier melts and the rock material it carries is dropped. Because this sediment is not moved much by water, a till is unsorted, containing particles of different sizes and compositions. It is also unstratified (unlayered). A till may contain materials ranging in size from microscopic clay particles to large boulders. Most tills in Illinois are pebbly clays with only a few boulders.

Tills may be deposited as end moraines, the arc-shaped ridges that pile up along the glacier edges where the flowing ice is melting as fast as it moves forward. Till also may be deposited as ground moraines, or till plains, which are gently undulating sheets deposited when the ice front melts back, or retreats. Deposits of till identify areas once covered by glaciers. Northeastern Illinois has many alternating ridges and plains, which are the succession of end moraines and till plains deposited by the Wisconsinan glacier.

Sorted and stratified sediment deposited by water melting from the glacier is called outwash. Outwash is bedded, or layered, because the flow of water that deposited it varied in gradient, volume, velocity, and direction. As a meltwater stream washes the rock materials along, it sorts them by size--the fine sands, silts, and clays are carried farther downstream than the coarser gravels and cobbles. Typical Pleistocene outwash in Illinois is in multilayered beds of clays, silts, sands, and gravels that look much like modern stream deposits.

Outwash deposits are found not only in the area covered by the ice field but sometimes far beyond it. Meltwater streams ran off the top of the glacier, in crevices in the ice, and under the ice. In some places, the cobble-gravel-sand filling of the bed of a stream that flowed in the ice is preserved as a sinuous ridge called an esker. Cone-shaped mounds of coarse outwash, called kames, were formed where meltwater plunged through crevasses in the ice or into ponds along the edge of the glacier.

The finest outwash sediments, the clays and silts, formed bedded deposits in the ponds and lakes that filled glacier-dammed stream valleys, the sags of the till plains, and some low, moraine-diked till plains. Meltwater streams that entered a lake quickly lost speed and almost immediately dropped the sands and gravels they carried, forming deltas at the edge of the lake. Very fine sand and silts were moved across the lake bottom by wind-generated

currents, and the clays, which stayed in suspension longest, slowly settled out and accumulated with them.

Along the ice front, meltwater ran off in innumerable shifting and short-lived streams that laid down a broad, flat blanket of outwash that formed an outwash plain. Outwash was also carried away from the glacier in valleys cut by floods of meltwater. The Mississippi, Illinois, and Ohio Rivers occupy valleys that were major channels for meltwaters and were greatly widened and deepened during times of the greatest meltwater floods. When the floods waned, these valleys were partly filled with outwash far beyond the ice margins. Such outwash deposits, largely sand and gravel, are known as valley trains. Valley trains may be both extensive and thick deposits. For instance, the long valley train of the Mississippi Valley is locally as much as 200 feet thick.

Loess and Soils

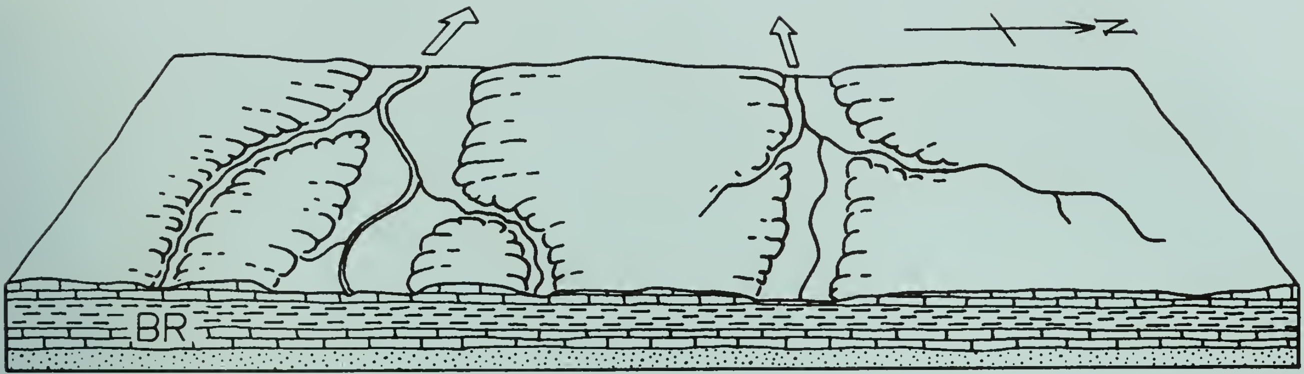
One of the most widespread sediments resulting from glaciation was carried not by ice or water but by wind. Loess is the name given to such deposits of windblown silt and clay. The silt was blown from the valley trains on the floodplains. Most loess deposition occurred in the fall and winter seasons when low temperatures caused meltwater floods to abate, exposing the surfaces of the valley trains and permitting them to dry out. During Pleistocene time, as now, west winds prevailed, and the loess deposits are thickest on the east sides of the source valleys. The loess thins rapidly away from the valleys but extends over almost all the state.

Each Pleistocene glaciation was followed by an interglacial stage that began when the climate warmed enough to melt the glaciers and their snowfields. During these warmer intervals, when the climate was similar to that of today, drift and loess surfaces were exposed to weather and the activities of living things. Consequently, over most of the glaciated terrain, soils developed on the Pleistocene deposits and altered their composition, color, and texture. Such soils were generally destroyed by later glacial advances, but those that survive serve as keys to the identity of the beds and are evidence of the passage of a long interval of time.

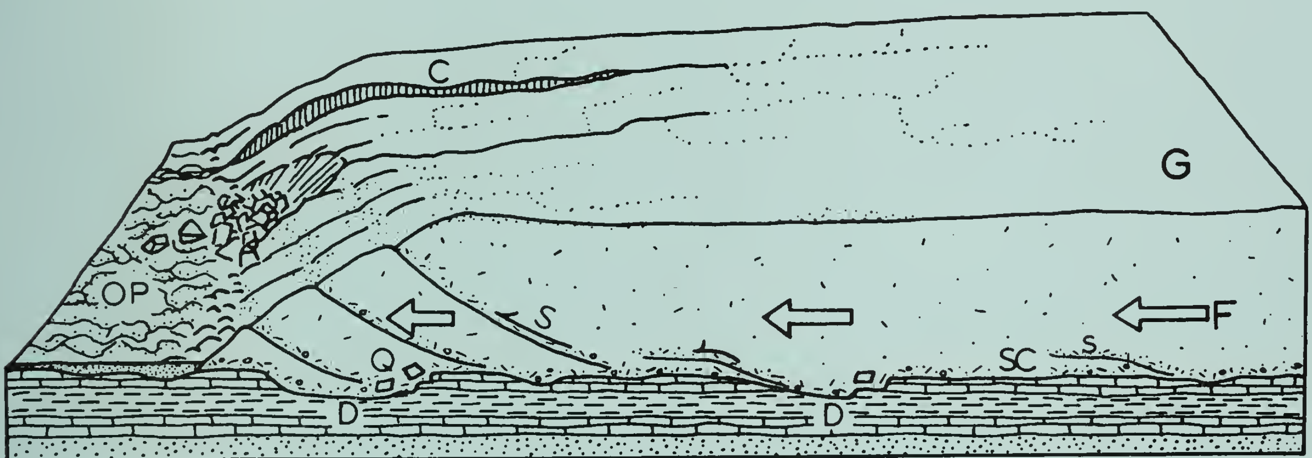
Glaciation in a Small Illinois Region

The following diagrams show how a continental ice sheet might have looked as it moved across a small region in Illinois. They illustrate how it could change the old terrain and create a landscape like the one we live on. To visualize how these glaciers looked, geologists study the landforms and materials left in the glaciated regions and also the present-day mountain glaciers and polar ice caps.

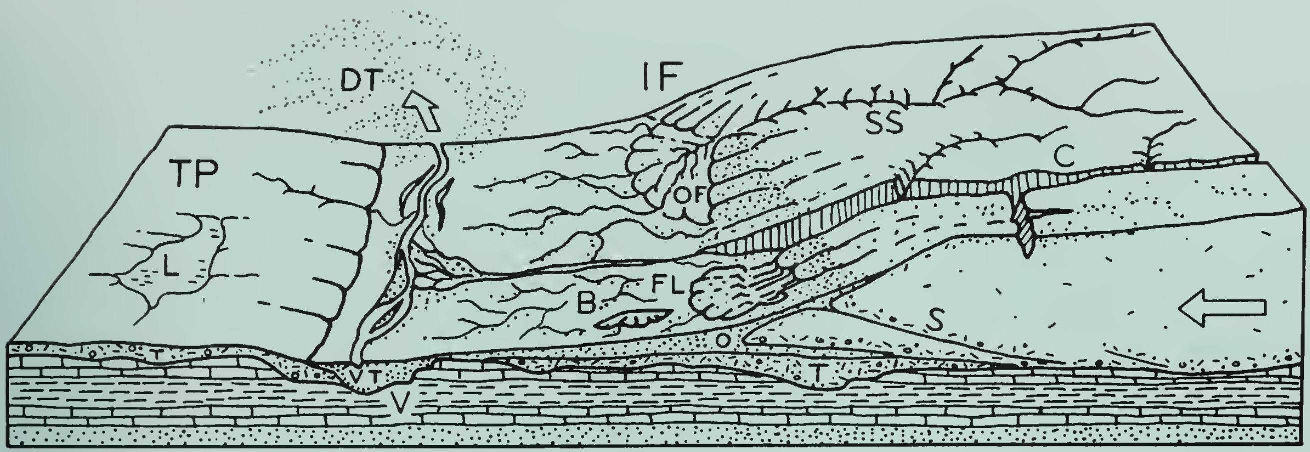
The block of land in the diagrams is several miles wide and about 10 miles long. The vertical scale is exaggerated--layers of material are drawn thicker and landforms higher than they ought to be so that they can be easily seen.



1. <u>The Region Before Glaciation</u> - Like most of Illinois, the region illustrated is underlain by almost flat-lying beds of sedimentary rocks--layers of sandstone ( ), limestone ( ), and shale ( ). Millions of years of erosion have planed down the bedrock (BR), creating a terrain of low uplands and shallow valleys. A residual soil weathered from local rock debris covers the area but is too thin to be shown in the drawing. The streams illustrated here flow westward and the one on the right flows into the other at a point beyond the diagram.



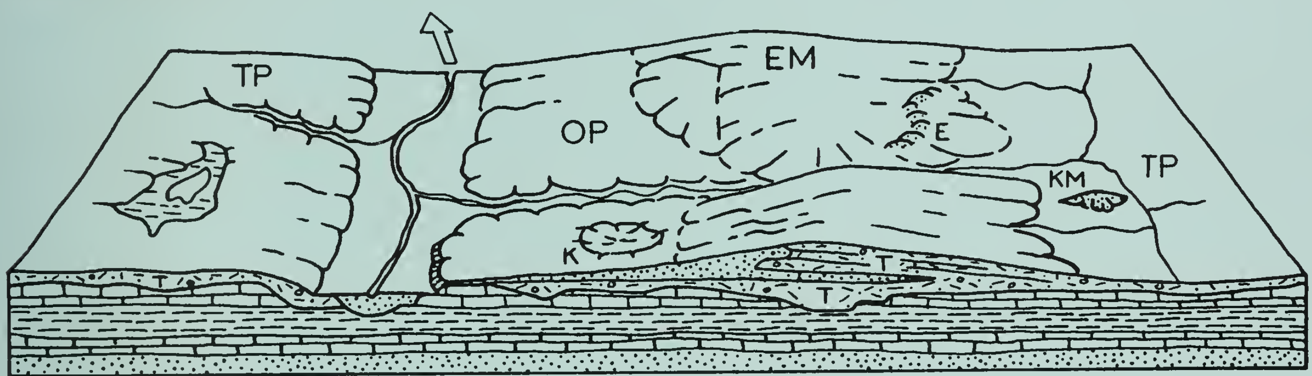
2. <u>The Glacier Advances Southward</u> - As the glacier (G) spreads out from its snowfield, it scours (SC) the soil and rock surface and quarries (Q)--pushes and plucks up--chunks of bedrock. These materials are mixed into the ice and make up the glacier's "load." Where roughnesses in the terrain slow or stop flow (F), the ice "current" slides up over the blocked ice on innumerable shear planes (S). Shearing mixes the load very thoroughly. As the glacier spreads, long cracks called "crevasses" (C) open parallel to the direction of ice flow. The glacier melts as it flows forward, and its meltwater erodes the terrain in front of the ice, deepening (D) some old valleys before the ice covers them. Meltwater washes away some of the load freed by melting and deposits it on the outwash plain (OP). The advancing glacier overrides its outwash and in places scours much of it up again. The glacier may be 5000 or so feet thick , except near its margin. Its ice front advances perhaps as much as a third of a mile per year.



3. The Glacier Deposits an End Moraine - After the glacier advanced across the area, the climate warmed and the ice began to melt as fast as it advanced. The ice front (IF) is now stationary, or fluctuating in a narrow area, and the glacier is depositing an end moraine.

As the top of the glacier melts, some of the sediment that was mixed in the ice accumulates on top of the glacier. Some is carried by meltwater onto the sloping ice front (IF) and out onto the plain beyond. Some of the debris slips down the ice front in a mudflow (FL). Meltwater runs through the ice in a crevasse (C). A superglacial stream (SS) drains the top of the ice, forming an outwash fan (OF). Moving ice has overridden an immobile part of the front on a shear plane (S). All but the top of a block of ice (B) is buried by outwash (O).

Sediment from the melted ice of the previous advance (figure 2) was left as a till layer (T), part of which forms the till plain (TP). A shallow, marshy lake (L) fills a low place in the plain. Although largely filled with drift, the valley (V) remained a low spot in the terrain. As soon as its ice cover melted, meltwater drained down the valley, cutting it deeper. Later, outwash partly refilled the valley--the outwash deposit is called a valley train (VT). Wind blows dust (DT) off the dry floodplain. The dust will form a loess deposit when it settles.



4. The Region after Glaciation - The climate has warmed even more, the whole ice sheet has melted, and the glaciation has ended. The end moraine (EM) is a low, broad ridge between the outwash plain (OP) and till plains (TP). Run-off from rains cuts stream valleys into its slopes. A stream goes through the end moraine along the channel cut by the meltwater that ran out of the crevasse in the glacier.

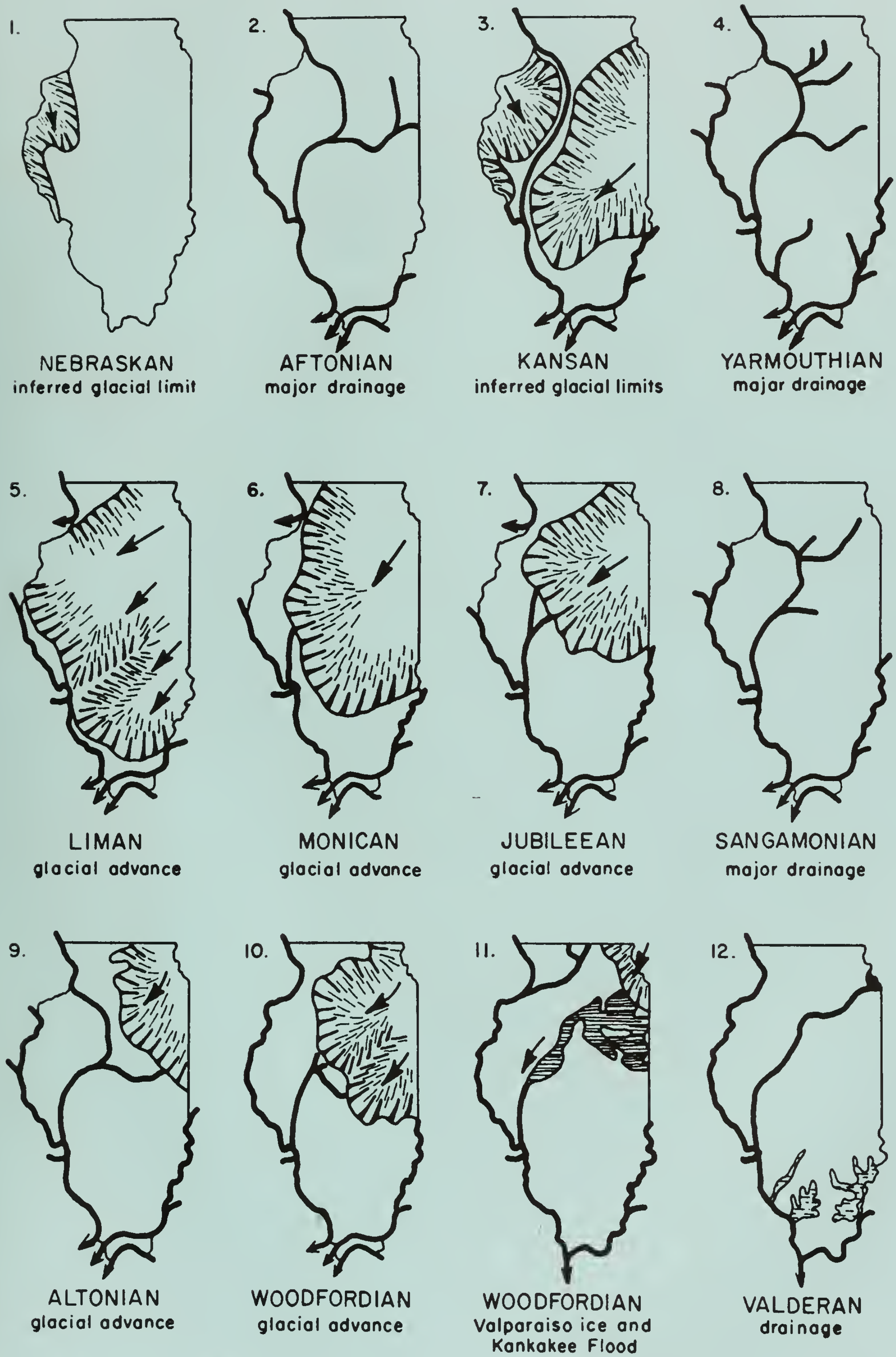
Slopewash and vegetation are filling the shallow lake. The collapse of outwash into the cavity left by the ice block's melting has made a kettle (K). The outwash that filled a tunnel draining under the glacier is preserved in an esker (E). The hill of outwash left where meltwater dumped sand and gravel into a crevasse or other depression in the glacier or at its edge is a kame (KM). A few feet of loess covers the entire area but cannot be shown at this scale.

TIME TABLE OF PLEISTOCENE GLACIATION

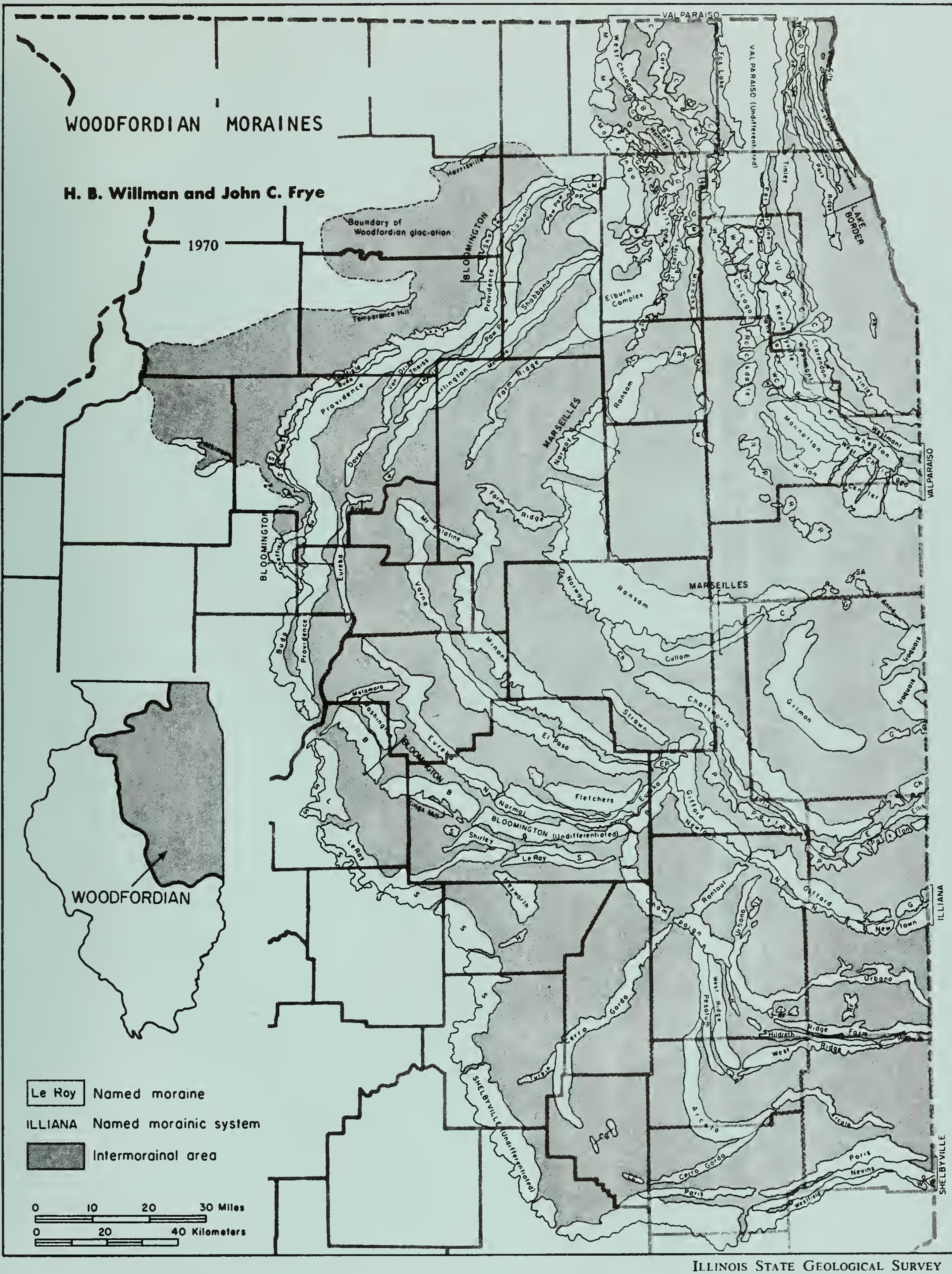
STAGE	SUBSTAGE	NATURE OF DEPOSITS	SPECIAL FEATURES
HOLOCENE	Years Before Present	Soil, youthful profile of weathering, lake and river deposits, dunes, peat	
	7,000		
WISCONSINAN (4th glacial)	Valderan	Outwash, lake deposits	Outwash along Mississippi Valley
	11,000		
	Twocreekan	Peat and alluvium	Ice withdrawal, erosion
	12,500		
	Woodfordian	Drift, loess, dunes, lake deposits	Glaciation; building of many moraines as far south as Shelbyville; extensive valley trains, outwash plains, and lakes
	22,000		
	Farmdalian	Soil, silt, and peat	Ice withdrawal, weathering, and erosion
	28,000		
	Altonian	Drift, loess	Glaciation in northern Illinois, valley trains along major rivers
	75,000		
SANGAMONIAN (3rd interglacial)		Soil, mature profile of weathering	
	175,000		
ILLINOIAN (3rd glacial)	Jubileean Monican Liman	Drift, loess Drift, loess Drift, loess	Glaciers from northeast at maximum reached Mississippi River and nearly to southern tip of Illinois
	300,000		
YARMOUTHIAN (2nd interglacial)		Soil, mature profile of weathering	
	600,000		
KANSAN (2nd glacial)		Drift, loess	Glaciers from northeast and northwest covered much of state
	700,000		
AFTONIAN (1st interglacial)		Soil, mature profile of weathering	
	900,000		
NEBRASKAN (1st glacial)		Drift	Glaciers from northwest invaded western Illinois
	1,200,000 or more		

(Illinois State Geological Survey, 1973)

SEQUENCE OF GLACIATIONS AND INTERGLACIAL DRAINAGE IN ILLINOIS



(From Willman and Frye, "Pleistocene Stratigraphy of Illinois," ISGS Bull. 94, fig. 5, 1970.)


WOODFORDIAN MORAINES
H. B. Willman and John C. Frye
1970
Boundary of Woodfordian glaciation
VALPARAISO
VALPARAISO (Undifferentiated)
LAKE BORDER
BLOOMINGTON
MARSEILLES
ILLIANA
SHELBYVILLE
SHELBYVILLE (Undifferentiated)
BLOOMINGTON (Undifferentiated)
West Chicago
Fox Lake
Tinley
Park Ridge
Elburn Complex
Ransom
Farm Ridge
Providence
Shabbona
Paw Paw
Temperance Hill
Harrisville
Bloomington
Dover
Mt Palatine
Eureka
Varna
Minonk
Norway
Cullom
Chatsworth
Strawn
El Paso
Fletchers
Normal
Shirley
Le Roy
Heyworth
Gilman
Iroquois
Rantoul
Urbana
Pesotum
West Ridge
Cerro Gordo
Arcola
Paris
Nevins
Westfield
Manhattan
Wilton
Wheaton
Westmont
Clarendon
Woodstock
Marengo
Gilford
Newtown
Paxton
Ellis
Hildreth
Turpin
Melamora
Washington
Kings Mill
Le Roy
Named moraine
ILLIANA
Named morainic system
Intermorainal area
WOODFORDIAN
0 10 20 30 Miles
0 20 40 Kilometers

ILLINOIS STATE GEOLOGICAL SURVEY

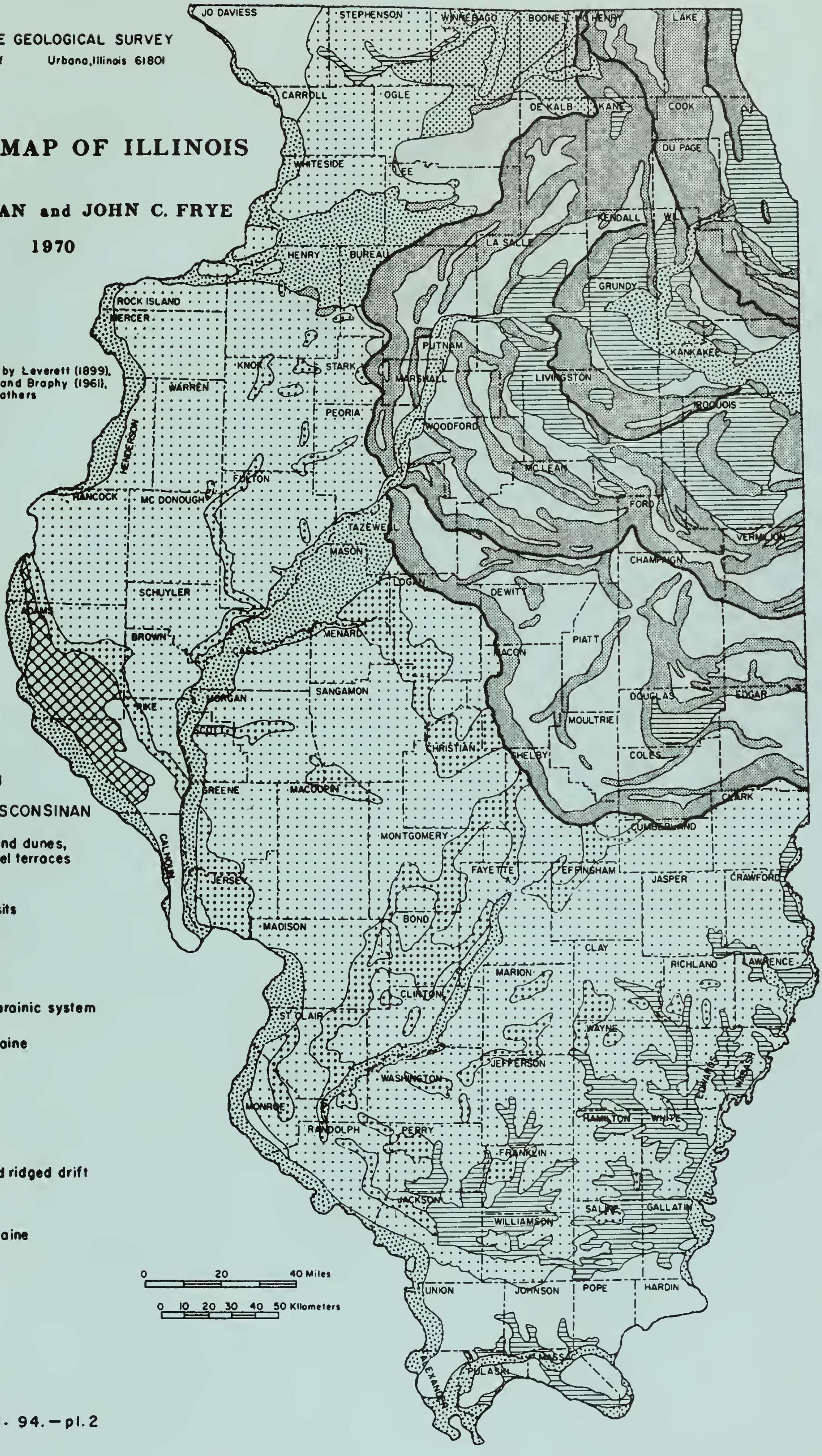
John C. Frye, Chief   Urbana, Illinois 61801

GLACIAL MAP OF ILLINOIS

H.B. WILLMAN and JOHN C. FRYE

1970

Modified from maps by Leverett (1899), Ekblaw (1959), Leighton and Brophy (1961), Willman et al. (1967), and others



EXPLANATION

HOLOCENE AND WISCONSINAN

Alluvium, sand dunes, and gravel terraces

WISCONSINAN

Lake deposits

WOODFORDIAN

Moraine

Front of morainic system

Groundmoraine

ALTONIAN

Till plain

ILLINOIAN

Moraine and ridged drift

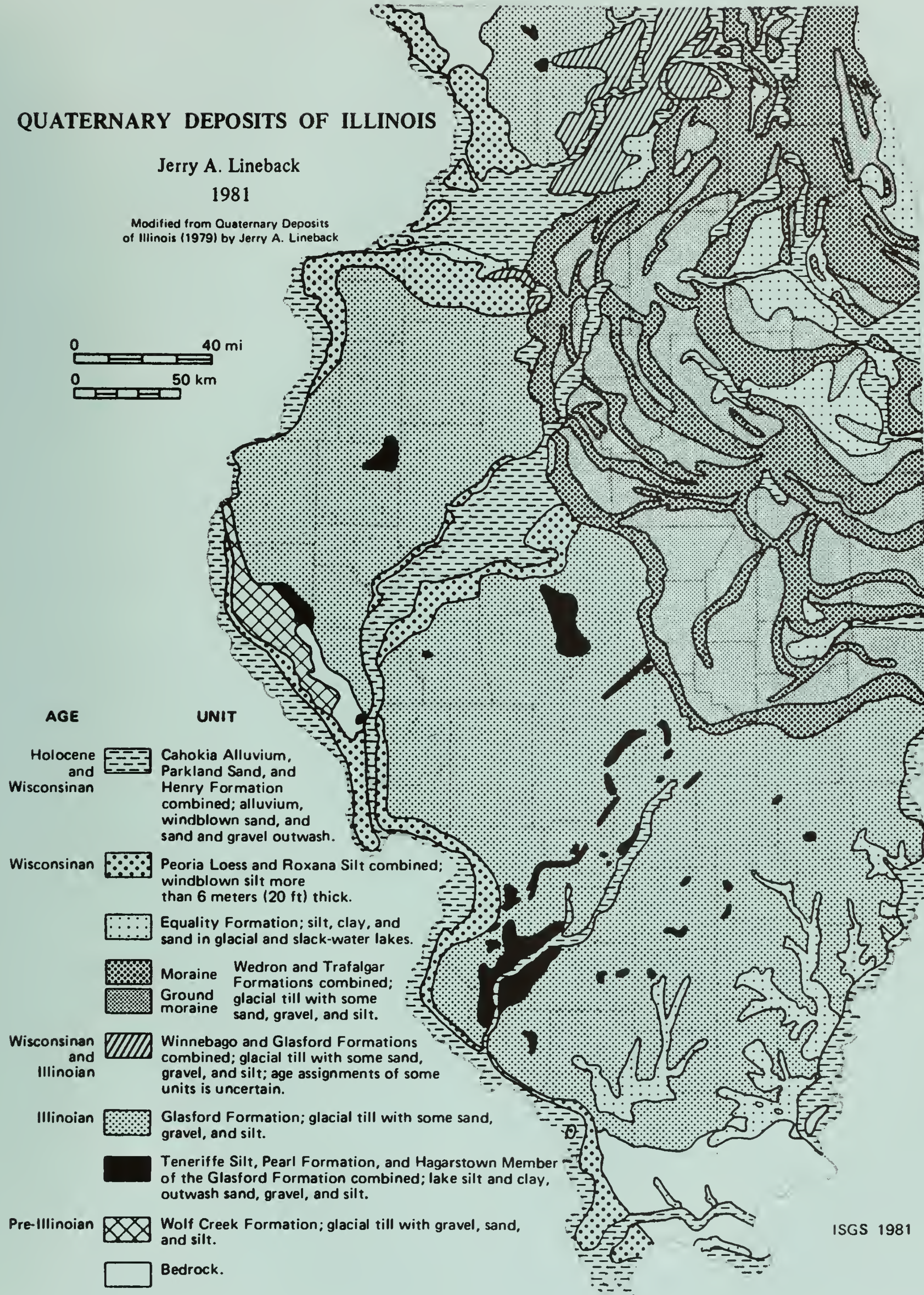
Groundmoraine

KANSAN

Till plain

DRIFTLESS

Modified from Bull. 94.—pl. 2


QUATERNARY DEPOSITS OF ILLINOIS
Jerry A. Lineback
1981
Modified from Quaternary Deposits of Illinois (1979) by Jerry A. Lineback
0 40 mi
0 50 km
AGE
UNIT
Holocene and Wisconsinan
Cahokia Alluvium, Parkland Sand, and Henry Formation combined; alluvium, windblown sand, and sand and gravel outwash.
Wisconsinan
Peoria Loess and Roxana Silt combined; windblown silt more than 6 meters (20 ft) thick.
Equality Formation; silt, clay, and sand in glacial and slack-water lakes.
Moraine
Ground moraine
Wedron and Trafalgar Formations combined; glacial till with some sand, gravel, and silt.
Wisconsinan and Illinoian
Winnebago and Glasford Formations combined; glacial till with some sand, gravel, and silt; age assignments of some units is uncertain.
Illinoian
Glasford Formation; glacial till with some sand, gravel, and silt.
Teneriffe Silt, Pearl Formation, and Hagarstown Member of the Glasford Formation combined; lake silt and clay, outwash sand, gravel, and silt.
Pre-Illinoian
Wolf Creek Formation; glacial till with gravel, sand, and silt.
Bedrock.
ISGS 1981

DEPOSITIONAL HISTORY OF THE PENNSYLVANIAN ROCKS

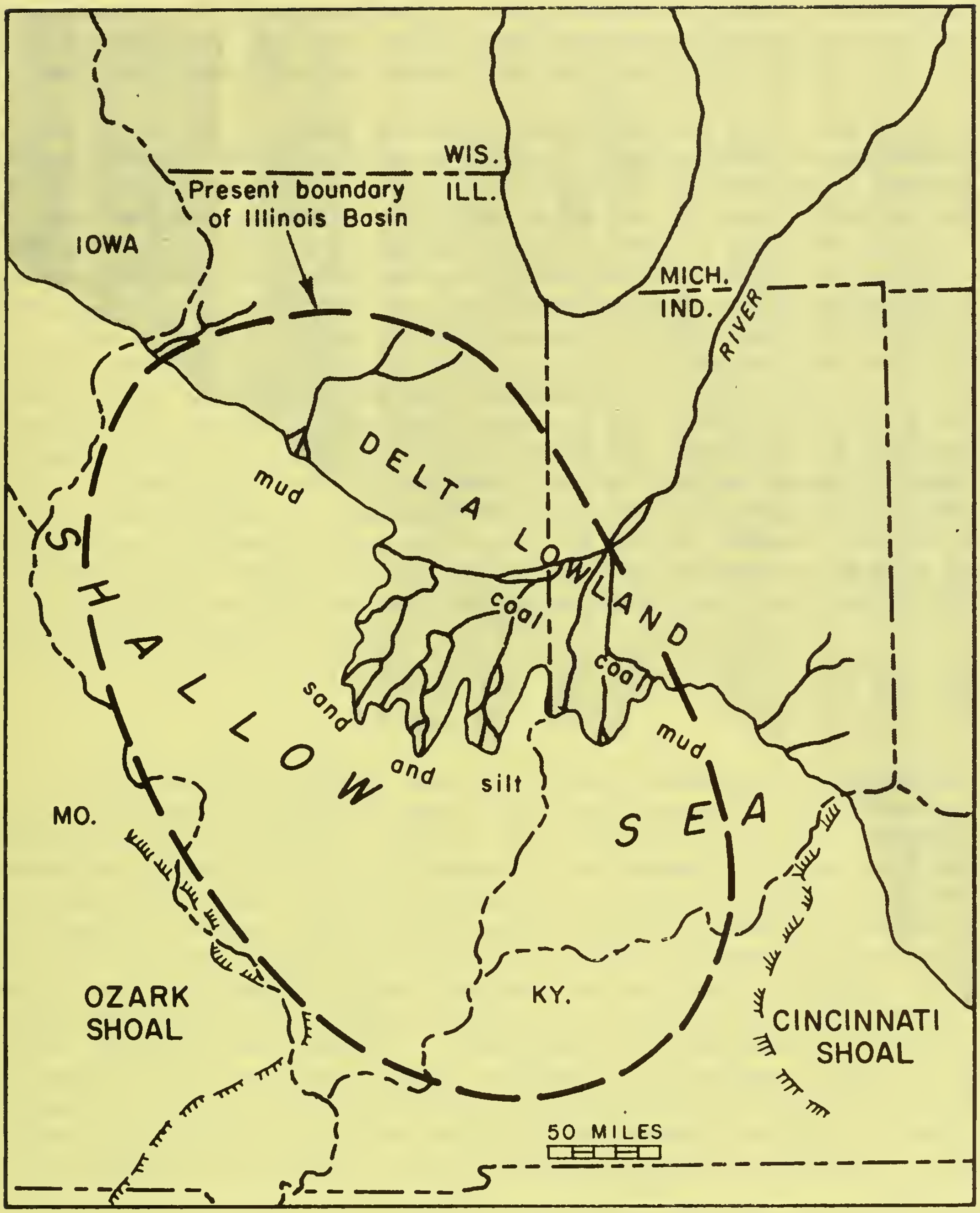
At the close of the Mississippian Period, about 310 million years ago, the Mississippian sea withdrew from the Midcontinent region. A long interval of erosion took place early in Pennsylvanian time and removed hundreds of feet of the pre-Pennsylvanian strata, completely stripping them away and cutting into older rocks over large areas of the Midwest. An ancient river system cut deep channels into the bedrock surface. Erosion was interrupted by the invasion of the Morrowan (early Pennsylvanian) sea.

Depositional conditions in the Illinois Basin during the Pennsylvanian Period were somewhat similar to those that existed during Chesterian (late Mississippian) time. A river system flowed southwestward across a swampy lowland, carrying mud and sand from highlands in the northeast. A great delta was built out into the shallow sea (see paleogeography map on next page). As the lowland stood only a few feet above sea level, only slight changes in relative sea level caused great shifts in the position of the shoreline.

Throughout Pennsylvanian time the Illinois Basin continued to subside while the delta front shifted owing to worldwide sea level changes, intermittent subsidence of the basin, and variations in the amounts of sediment carried seaward from the land. These alternations between marine and nonmarine conditions were more frequent than those during pre-Pennsylvanian time, and they produced striking lithologic variations in the Pennsylvanian rocks.

Conditions at various places on the shallow sea floor favored the deposition of sandstone, limestone, or shale. Sandstone was deposited near the mouths of distributary channels. These sands were reworked by waves and spread as thin sheets near the shore. The shales were deposited in quiet-water areas—in delta bays between distributaries, in lagoons behind barrier bars, and in deeper water beyond the nearshore zone of sand deposition. Most sediments now recognized as limestones, which are formed from the accumulation of limey parts of plants and animals, were laid down in areas where only minor amounts of sand and mud were being deposited. Therefore, the areas of sandstone, shale, and limestone deposition continually changed as the position of the shoreline changed and as the delta distributaries extended seaward or shifted their positions laterally along the shore.

Nonmarine sandstones, shales, and limestones were deposited on the deltaic lowland bordering the sea. The nonmarine sandstones were deposited in distributary channels, in river channels, and on the broad floodplains of the rivers. Some sand bodies, 100 or more feet thick, were deposited in channels that cut through many of the underlying rock units. The shales were deposited mainly on floodplains. Fresh-water limestones and some shales were deposited locally in fresh-water lakes and swamps. The coals were formed by the accumulation of plant material, usually where it grew, beneath the quiet waters of extensive swamps that prevailed for long intervals on the emergent delta lowland. Lush forest vegetation, which thrived in the warm, moist Pennsylvanian climate, covered the region. The origin of the underclays beneath the coals is not precisely known, but they were probably deposited in the swamps as slackwater muds before the formation of the coals. Many underclays contain plant roots and rootlets that appear to be in their original places. The formation of coal marked the end of the nonmarine portion of the depositional cycle, for resubmergence of the borderlands by the sea interrupted nonmarine deposition, and marine sediments were then laid down over the coal.



Paleogeography of Illinois-Indiana region during Pennsylvanian time. The diagram shows the Pennsylvanian river delta and the position of the shoreline and the sea at an instant of time during the Pennsylvanian Period.

Pennsylvanian Cyclothems

Because of the extremely varied environmental conditions under which they formed, the Pennsylvanian strata exhibit extraordinary variations in thickness and composition, both laterally and vertically. Individual sedimentary units are often only a few inches thick and rarely exceed 30 feet thick. Sandstones and shales commonly grade laterally into each other, and shales sometimes interfinger and grade into limestones and coals. The underclays, coals, black shales, and

limestones, however, display remarkable lateral continuity for such thin units (usually only a few feet thick). Coal seams have been traced in mines, outcrops, and subsurface drill records over areas comprising several states.

The rapid and frequent changes in depositional environments during Pennsylvanian time produced regular or cyclical alternations of sandstone, shale, limestone, and coal in response to the shifting front of the delta lowland. Each series of alternations, called a cyclothem, consists of several marine and nonmarine rock units that record a complete cycle of marine invasion and retreat. Geologists have determined, after extensive studies of the Pennsylvanian strata in the Midwest, that an ideally complete cyclothem consists of 10 sedimentary units. The chart on the next page shows the arrangement. Approximately 50 cyclothems have been described in the Illinois Basin, but only a few contain all 10 units. Usually one or more are missing because conditions of deposition were more varied than indicated by the ideal cyclothem. However, the order of units in each cyclothem is almost always the same. A typical cyclothem includes a basal sandstone overlain by an underclay, coal, black sheety shale, marine limestone, and gray marine shale. In general, the sandstone-underclay-coal portion (the lower 5 units) of each cyclothem is nonmarine and was deposited on the coastal lowlands from which the sea had withdrawn. However, some of the sandstones are entirely or partly marine. The units above the coal are marine sediments and were deposited when the sea advanced over the delta lowland.

Origin of Coal

It is generally accepted that the Pennsylvanian coals originated by the accumulation of vegetable matter, usually in place, beneath the waters of extensive, shallow, fresh-to-brackish swamps. They represent the last-formed deposits of the nonmarine portions of the cyclothems. The swamps occupied vast areas of the deltaic coastal lowland, which bordered the shallow Pennsylvanian sea. A luxuriant growth of forest plants, many quite different from the plants of today, flourished in the warm Pennsylvanian climate. Today's common deciduous trees were not present, and the flowering plants had not yet evolved. Instead, the jungle-like forests were dominated by giant ancestors of present-day club mosses, horsetails, ferns, conifers, and cycads. The undergrowth also was well developed, consisting of many ferns, fernlike plants, and small club mosses. Most of the plant fossils found in the coals and associated sedimentary rocks show no annual growth rings, suggesting rapid growth rates and lack of seasonal variations in the climate. Many of the Pennsylvanian plants, such as the seed ferns, eventually became extinct.

Plant debris from the rapidly growing swamp forests—leaves, twigs, branches, and logs—accumulated as thick mats of peat on the floors of the swamps. Normally, vegetable matter rapidly decays by oxidation, forming water, nitrogen, and carbon dioxide. However, the cover of swamp water, which was probably stagnant and low in oxygen, prevented the complete oxidation and decay of the peat deposits.

The periodic invasions of the Pennsylvanian sea across the coastal swamps killed the Pennsylvanian forests and initiated marine conditions of deposition. The peat deposits were buried by marine sediments. Following burial, the peat deposits were gradually transformed into coal by slow chemical and physical changes in which pressure (compaction by the enormous weight of overlying sedimentary layers), heat (also due to deep burial), and time were the most important factors. Water and volatile substances (nitrogen, hydrogen, and oxygen) were slowly driven off during the coalification process, and the peat deposits were changed into coal.

Coals have been classified by ranks that are based on the degree of coalification. The commonly recognized coals, in order of increasing rank, are (1) brown coal or lignite, (2) sub-bituminous, (3) bituminous, (4) semibituminous, (5) semianthracite, and (6) anthracite. Each increase in rank is characterized by larger amounts of fixed carbon and smaller amounts of oxygen and other volatiles. Hardness of coal also increases with increasing rank. All Illinois coals are classified as bituminous.

Underclays occur beneath most of the coals in Illinois. Because underclays are generally unstratified (unlayered), are leached to a bleached appearance, and generally contain plant roots, many geologists consider that they represent the ancient soils on which the coal-forming plants grew.

The exact origin of the carbonaceous black shales that occur above many coals is uncertain. The black shales probably are deposits formed under restricted marine (lagoonal) conditions during the initial part of the invasion cycle, when the region was partially closed off from the open sea. In any case, they were deposited in quiet-water areas where very fine, iron-rich muds and finely divided plant debris were washed in from the land. The high organic content of the black shales is also in part due to the carbonaceous remains of plants and animals that lived in the lagoons. Most of the fossils represent planktonic (floating) and nektonic (swimming) forms—not benthonic (bottom dwelling) forms. The depauperate (dwarf) fossil forms sometimes found in black shales formerly were thought to have been forms that were stunted by toxic conditions in the sulfide-rich, oxygen-deficient waters of the lagoons. However, study has shown that the "depauperate" fauna consists mostly of normal-size individuals of species that never grew any larger.

GEOLOGIC MAP OF ILLINOIS
showing
BEDROCK BELOW
THE GLACIAL DRIFT
1970

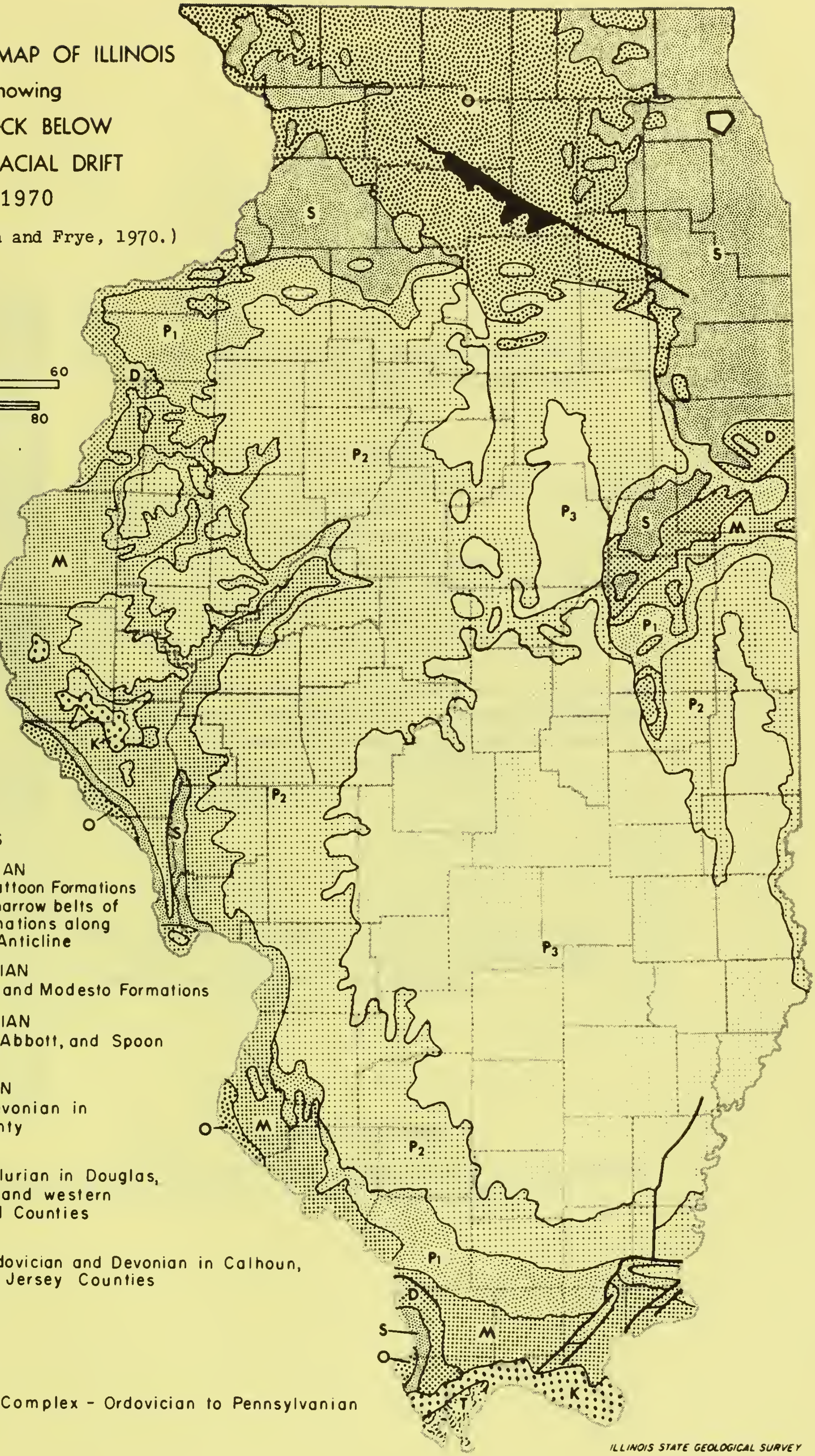
(From Willman and Frye, 1970.)

MILES

0 20 40 60

0 40 80

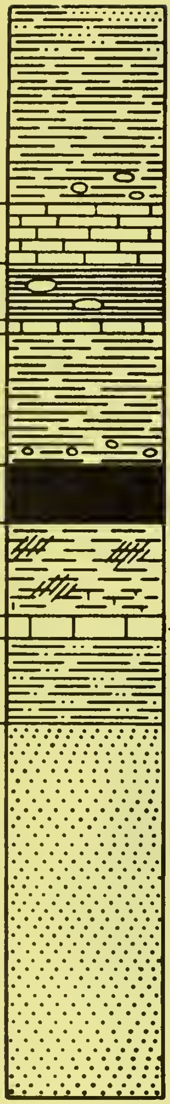
KILOMETERS



Pleistocene and
Pliocene not shown

- T — TERTIARY
- K — CRETACEOUS
- P_3 — PENNSYLVANIAN
  Bond and Mattoon Formations
  Includes narrow belts of older formations along La Salle Anticline
- P_2 — PENNSYLVANIAN
  Carbondale and Modesto Formations
- P_1 — PENNSYLVANIAN
  Caseyville, Abbott, and Spoon Formations
- M — MISSISSIPPIAN
  Includes Devonian in Hardin County
- D — DEVONIAN
  Includes Silurian in Douglas, Champaign, and western Rock Island Counties
- S — SILURIAN
  Includes Ordovician and Devonian in Calhoun, Greene, and Jersey Counties
- O — ORDOVICIAN
- CAMBRIAN
- Des Plaines Complex - Ordovician to Pennsylvanian
- Fault

ILLINOIS STATE GEOLOGICAL SURVEY



10 Shale, gray, sandy at top; contains marine fossils and ironstone concretions, especially in lower part.

9 Limestone; contains marine fossils.

8 Shale, black, hard, laminated; contains large spheroidal concretions and marine fossils.

7 Limestone; contains marine fossils.

6 Shale, gray; pyritic nodules and ironstone concretions common at base; plant fossils locally common at base; marine fossils rare.

5 Coal; locally contains clay or shale partings.

4 Underclay, mostly medium to light gray but dark gray at top; upper part noncalcareous, lower part calcareous.

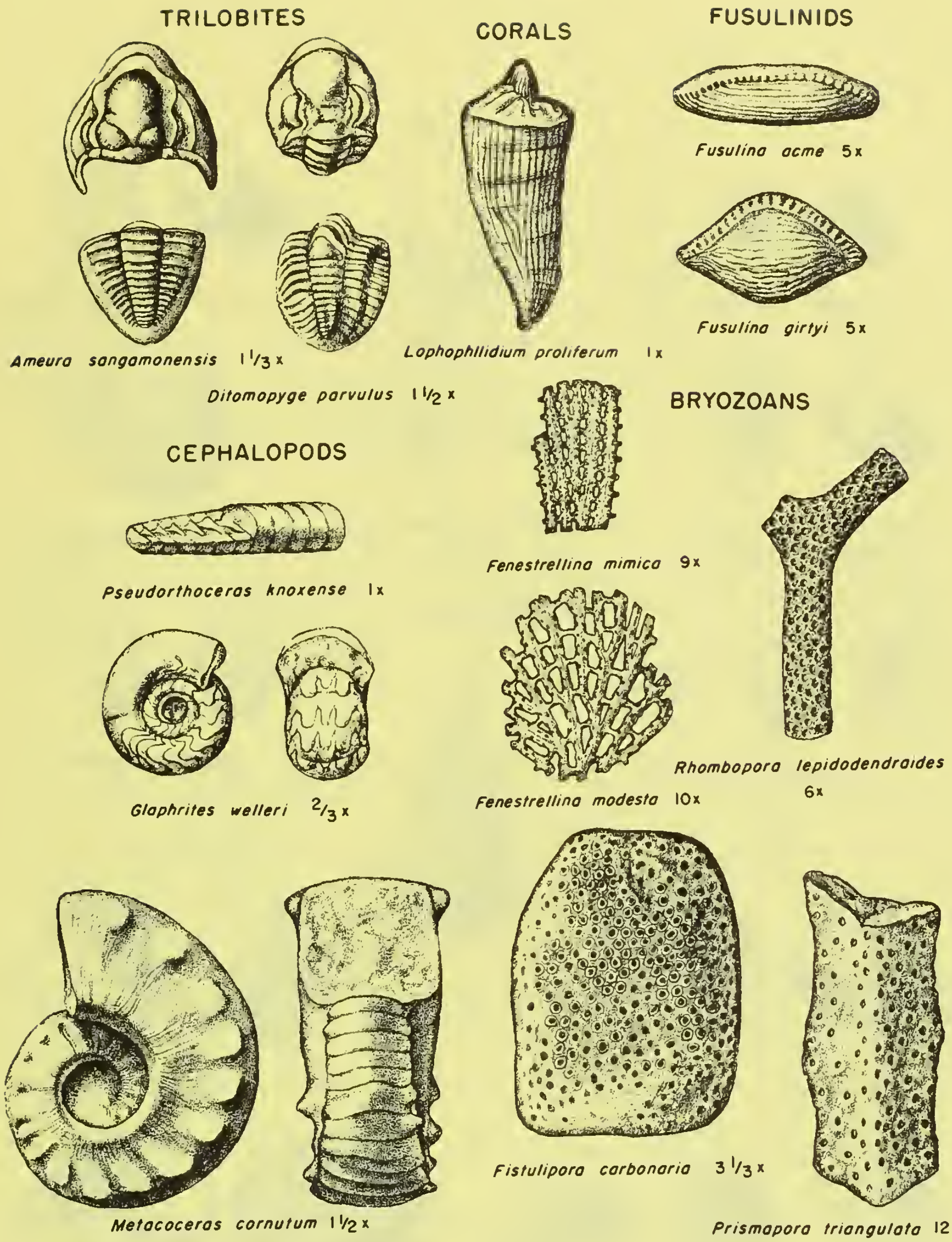
3 Limestone, argillaceous; occurs in nodules or discontinuous beds; usually nonfossiliferous.

2 Shale, gray, sandy.

1 Sandstone, fine grained, micaceous, and siltstone, argillaceous; varies from massive to thin bedded; usually has an uneven lower surface.

AN IDEALLY COMPLETE CYCLOTHEM

(Reprinted from Fig. 42, Bulletin No. 66, Geology and Mineral Resources of the Marseilles, Ottawa, and Streator Quadrangles, by H. B. Willman and J. Norman Payne)



TRILOBITES
CORALS
FUSULINIDS
Fusulina acme 5x
Fusulina girtyi 5x
Ameura sangamonensis 1 1/3 x
Lophophllidium proliferum 1x
Ditomopyge parvulus 1 1/2 x
BRYOZOANS
CEPHALOPODS
Pseudorthoceras knoxense 1x
Fenestrellina mimica 9x
Rhombopora lepidodendraides 6x
Glaphrites welleri 2/3 x
Fenestrellina modesta 10x
Fistulipora carbonaria 3 1/3 x
Metacoceras cornutum 1 1/2 x
Prismapora triangulata 12x

PELECYPODS

Nucula (Nuculopsis) girtyi 1x

Edmondia ovata 2x

Astartella concentrica 1x

Dunbarella knighti 1½x

Cardiomorpha missouriensis
"Type A" 1x

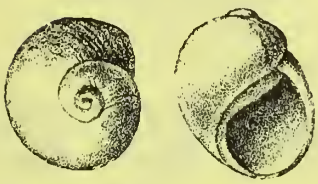
Cardiomorpha missouriensis
"Type B" 1½x

GASTROPODS

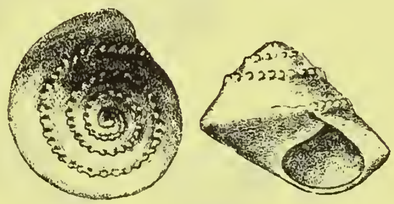
Euphemites carbonarius 1½x

Trepospira illinoisensis 1½x

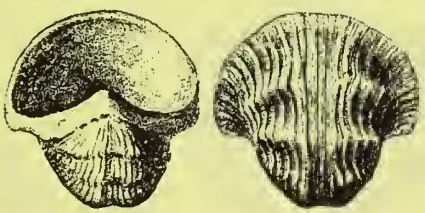
Donaldina robusta 8x



Naticopsis (Jedria) ventricosa 1½x



Trepospira sphaerulata 1x



Knightites montfortianus 2x

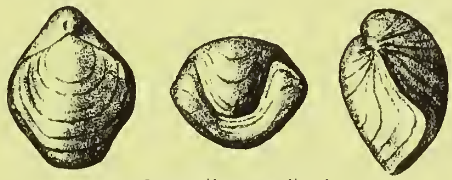
Glabrocingulum (Glabrocingulum) grayvillense 3x

BRACHIOPODS

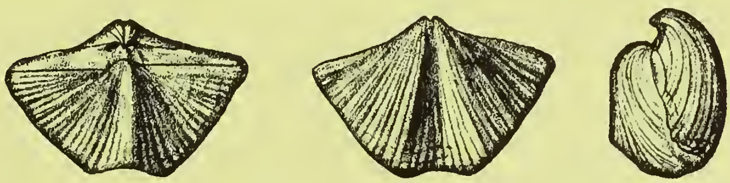
Juresania nebrascensis 2/3 x

Wellerella tetrahedra 1 1/2 x

Derbya crassa 1x

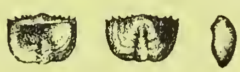


Composita argentia 1x



Neospirifer cameratus 1x

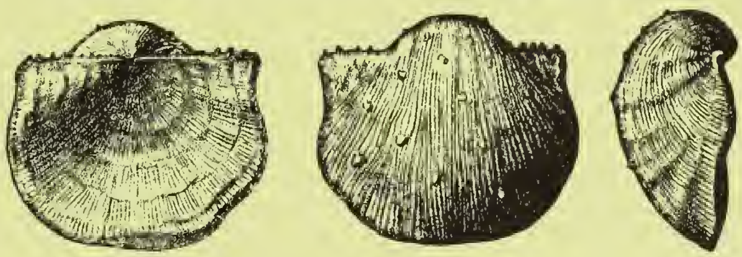
Chonetes granulifer 1 1/2 x



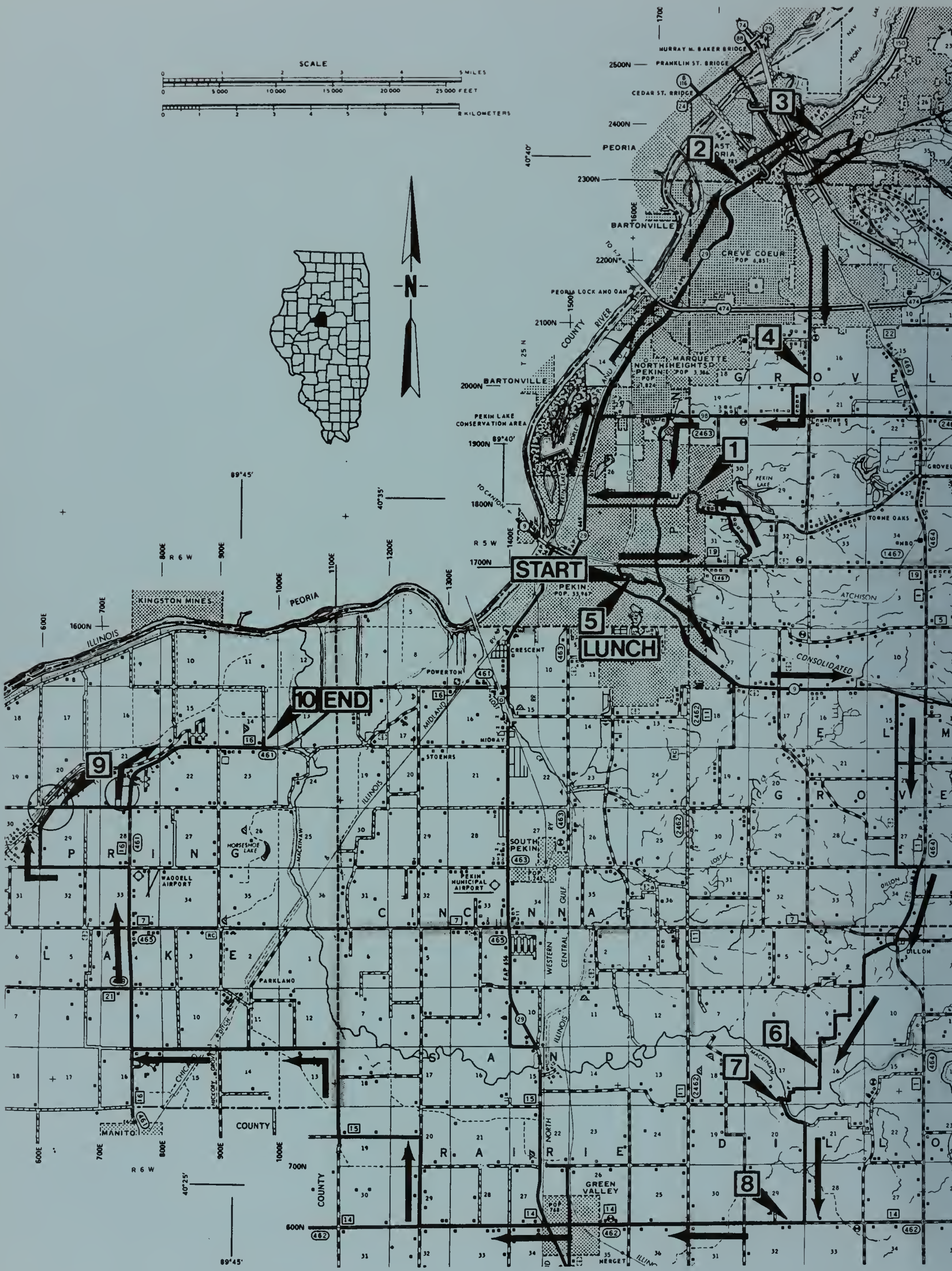
Mesolobus mesolobus var. euampygus 2 x

Marginifera splendens 1x

Crurithyris planoconvexa 2 x



Linoproductus "cora" 1x



SCALE
MILES
FEET
KILOMETERS
N
MURRAY M. BAKER BRIDGE
FRANKLIN ST. BRIDGE
CEDAR ST. BRIDGE
PEORIA
BARTONVILLE
CREVE COEUR
PEORIA LOCK AND DAM
MARQUETTE HEIGHTS
NORTH PEKIN
PEKIN LAKE CONSERVATION AREA
1
2
3
4
START
PEKIN
5
LUNCH
6
7
8
9
10 END
KINGSTON MINES
ILLINOIS
CRESCENT
POWERTON
MIDWAY
STOEHRS
SOUTH PEKIN
PEKIN MUNICIPAL AIRPORT
WADDELL AIRPORT
HORSESHOE LAKE
PARKLAND
MANITO
GREEN VALLEY
DILLON
TOWNE OAKS
ATCHISON
CONSOLIDATED
MACKINAW
G R O V E L A N D
E L M G R O V E
S P R I N G L A K E
C I N C I N N A T I
S A N D P R A I R I E
D I L L O N
COUNTY
R 6 W
R 5 W
T 25 N